$$P(t) = \frac{300}{1+2^{4-t}} = 300 \cdot (1+2^{4-t})^{-1}$$

$$P'(t) = -300 \cdot (1+2^{4-t})^{-2} \cdot 2^{4-t} \cdot \ln 2 \cdot -1$$

$$= \frac{300 \cdot 2^{4-t} \cdot \ln 2}{(1+2^{4-t})^2}$$

$$= \frac{(1+2^{4-t})^2 \cdot 300 \cdot 2^{4-t} \cdot \ln 2 \cdot -1 \cdot \ln 2 - 300 \cdot 2^{4-t} \cdot \ln 2 \cdot 2(1+2^{4-t}) \cdot 2^{4-t} \cdot \ln 2 \cdot -1}{(1+2^{4-t})^4}$$

$$-300 \cdot \ln 2 \cdot \ln 2 \cdot 2^{4-t} \cdot (1+2^{4-t})^2 = -300 \cdot \ln 2 \cdot 2^{4-t} \cdot \ln 2 \cdot 2(1+2^{4-t})$$

$$1+2^{4-t} = +2 \quad -1$$

$$-1$$

$$2^{4-t} = 1$$

$$4-t = \frac{\ln 1}{\ln 2}$$

$$t = 4 - \frac{\ln 1}{\ln 2}$$

$$\boxed{t = 4}$$

$$1 + e^{5-t} = 2e^{5-t}$$

$$-e^{5-t} \qquad -e^{5-t}$$

$$1 = e^{5-t}$$

$$\ln 1 = 5 - t$$

$$t = 5 - \ln 1$$

$$t = 5$$

$200(1+e^{5-t})^{-1}$

$200(1+e^{5-t})^{-2} \cdot e^{(5-t)}$

$\frac{200e^{5-t}}{(1+e^{5-t})^2}$

$\frac{200}{1+3(e^{5-t})}$

$(1+e^{(5-t)})(1+e^{(5-t)})$

$1+e^{(5-t)}+e^{(5-t)}+(e^{(5-t)})^2$

$\frac{[1+3(e^{5-t})](0)-[200][(3e^{5-t})]}{(1+3e^{5-t})^2}$

$\frac{600e^{5-t}}{(1+3e^{5-t})^2}$

$\frac{600e^{5-t}=0}{600}$

$e^{5-t}=0$

$5-t=\frac{\ln(0)}{\ln(e)}$

$5-t=0$

$t=5$

# Practice

4.1 #11-14

4.2 #6, 8, 19, 33, 49